

### Abstract

It is estimated that one-third of males worldwide are circumcised. The procedure is most commonly practiced in the Muslim world, Israel (where it is near-universal for religious reasons), the United States, and parts of Southeast Asia and Africa. It is relatively rare in Europe, Latin America, parts of Southern Africa, and most of Asia.

Prevalence of reported complications of male circumcision ranged from 7 to 50.1%. Late complications of 7.39 % were reported.

### Keywords

Complications • Male circumcision • Penile granuloma • Iatrogenic urethral fistulas • Post circumcision hair coil • Penile skin loss • Keloid formation • Gangrene • Penile loss • Ablatio penis • Skin bridge • Penile ischemia

It is estimated that one-third of males worldwide are circumcised. The procedure is most commonly practiced in the Muslim world, Israel (where it is near-universal for religious reasons), the United States, and parts of Southeast Asia and Africa. It is relatively rare in Europe, Latin America, parts of Southern Africa, and most of Asia [1] (Fig. 35.1).

Prevalence of reported complications of MC ranged from 7 % to 50.1 %. Late complications of 7.39 % were reported [2]. At 2010, a review of literature founded that MC performed by medical providers, have a typical complication rate of 1.5 % for babies and 6 % for older children, with few cases of severe complications [3]. In Africa and developing countries the circumcision rate

was 87 %, with a very high rate of complications reaching 20.2 % [4].

Circumcision remains as one of the most controversial topics in current urological practice. The most important argument against circumcision is the permanent change of anatomy, histology and function of the penis, with potential complications, primary haemorrhage was the most common (52 %), whereas infection, meatal stenosis, incomplete circumcision, penile oedema, glanular injury, penile adhesions, iatrogenic hypospadias and urethral injuries were also detected at different rates [5].

There may be a minor complications after circumcision which cannot be avoided even when the procedure is undertaken by specialised



**Fig. 35.1** Mass circumcision of a young children by unexperienced personal in unequipped centres

pediatric surgeons or urologist, in a properly equipped centres; specially if the child or his penis is congenitally abnormal, the obvious examples are, circumcising a child with an excessive suprapubic or a child with webbed penis or microphallus.

After practicing circumcision, and managing other's complication for a thousands of boys along 34 years in a country like Egypt, (with about 90 % circumcision rate), I found most parents had a great urge to do this surgery even for a handicapped or critically ill child, as you can see the child in Fig. 35.2, who had a Hip Spica Cast for bilateral hip dislocations, but family insisted to do circumcision for him (Fig. 35.2).

So the best way to minimise complications of MC, in my opinion, and to compete against its serious impaction in man health, is to standardise the procedure, learning both families and physicians about potential complications and how they could mange it early, and properly.

The spectrum of post MC complications is so wide to be discussed in this chapter, which concerning mainly about congenital anomalies, but these anomalies of the penis which discussed in



**Fig. 35.2** Family urge for circumcision may pouch them to do this procedure even for a baby with critical illness

this book may had a great impaction in the incidence of serious complications, so we will just spot some light over the uncommon complications, which usually raise a debate about its management.

There are different sets to classify MC complications: Either early, or late, minor or major, local or systemic, rare or common.

### 35.1 Post Circumcision Penile Granuloma: (Fig. 35.3)

The development of post circumcision penile granuloma was described well in a large series by Atikeler et al. [6], in which 26 cases of granuloma (5%) were found in 523 circumcised boys, with a mean time to development of 3.2 months. The cause of post circumcision granuloma has been postulated to be a foreign body (e.g. talcum powder, excess suture material, or smegma particles) introduced during circumcision between preputial layers, resulting in a tissue response manifested as a granuloma of different types (Fig. 35.3a).

**Suture granulomas** This is a reaction to the stitches not dissolving as intended. It appears as bumps under the skin around the wound as the skin creates a tiny wall of scar tissue around the suture to separate it from the body.

**Spitting Sutures** This occurs weeks to months after surgery if the body rejects the suture (again, from the stitches not absorbing as intended) and attempts to remove them by pushing the stitches out to the surface of the skin. Sutures that migrate in this way have been known to be the source of additional problems.

Pyogenic granuloma: Will be described with balanitis (Chap. 39)

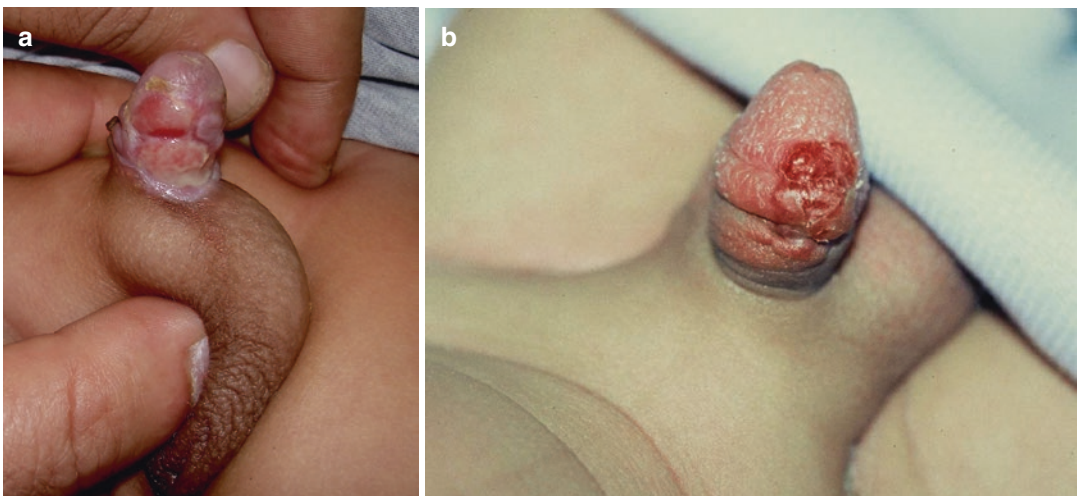
Smegma granuloma: (Chap. 19)

**Excessive penile skin loss** Which occurs when so much of the prepuce is drawn forward that the entire penile skin sheath is removed. From puberty on, penile bowing (curvature) and pain occur at the time of erection, commonly skin loss seen at the ventral surface of the penis. (Fig. 35.4), but a circumferential skin loss is not rare, which complicate extensive perpetual excision by unexperienced surgeon or unqualified circumciser (Fig. 35.5).

Excessive skin loss complication encountered mainly after circumcision of a congenitally abnormal penis as in cases of webbed penis, microphallus, concealed penis and penis with a congenital chordee.

In webbed penis, If surgeon tried to circumcise a baby by the classical method, usually he will end with extensive loss of the ventral skin, so removal of prepuce from the dorsum only leaving the ventral prepuce to cover the shaft with fine stitches may be enough, with an acceptable penile look, as we can see in Fig. 35.6a, b and c. This simple method can be done by surgeons who had minimal experience with the different methods of flaps or V-Y plasty described in literature for managing such cases [7]. But sometimes, specially in severe cases, a pedicled skin grafts or flap are indicated.

Microphallus is another problem, as the circumciser may face some families insisted to do circumcision early before the child can catch up an acceptable penile length, and in such cases



**Fig. 35.3** (a) Granuloma with severe infection and skin loss from the lateral aspect of the shaft of the penis. (b) Post circumcision granuloma at the dorsum of the glans





**Fig. 35.4** Post circumcision ventral skin loss, due to circumcision of a webbed penis by simple application of the crushing forceps

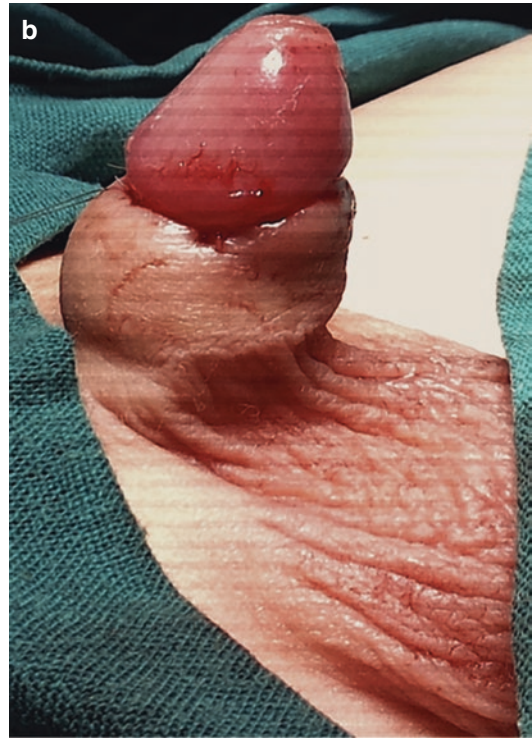


**Fig 35.5** Circumferential skin loss which will need a rotational flap or free skin graft

also, meticulous removal of a narrow strip of prepuce, with making use of the rest of the prepuce to cover the shaft of the penis may give an acceptable results without skin loss (Fig. 35.7a, b).

### 35.2 Post Circumcision Iatrogenic Urethral Fistulas: (Figs. 35.8 and 35.9)

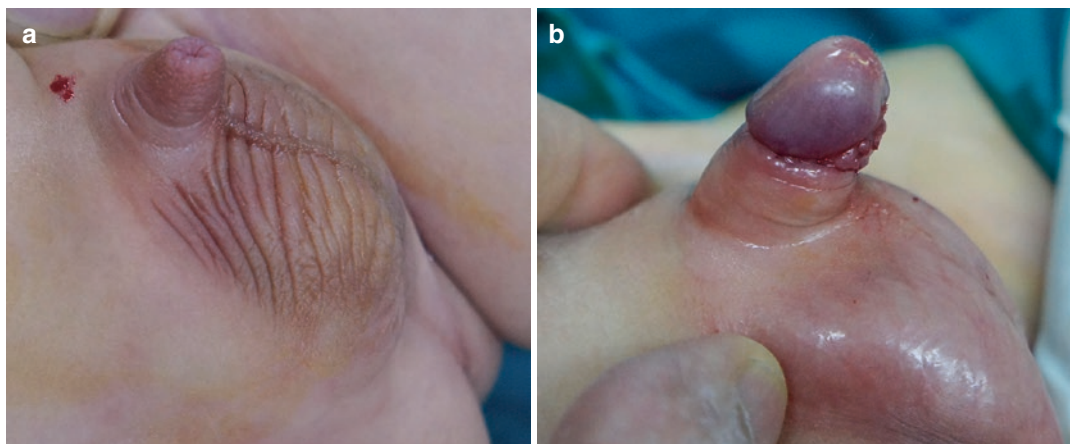
Different types of urethral fistulas may result from circumcision, when the frenular area (underside of the penis) is drawn too far forward, the crushing bell of plastibell circumcision may



**Fig. 35.6** (a) Webbed penis, managed with circumcision by dissection method, leaving a plenty of skin at the ventral surface, with an acceptable look and reasonable functional penile length (b)

injure the urethra at the time the foreskin is removed, resulting in a urethral opening on the underside of the shaft. Fistulae may present as an obvious tract or as a split urine stream (Fig. 35.8).

The urethrocutaneous fistula is not a rare complication after both Plastibell and Gomco circumcisions. Often this is a result from compression necrosis from a retained Plastibell ring or a direct injury from incorrect placement of the Gomco clamp [8] (Fig. 35.8a).



**Fig. 35.7** (a, b) Microphallus could be managed by only excision of a small strip from the prepuce



**Fig. 35.8** (a) Neglectfully retained Plastibell results in penile necrosis, and eventually ends with fistula. (b) Proximal fistula, complicating severe infection, and necrosis after circumcision. (c) Post circumcision distal fistula





**Fig. 35.9** (a) Post circumcision hair coil, which may be complicated with fistula. (b): Fistula at the coronal sulcus from hair coil. (c) Severe constricting fibrosis at the sulcus with double or kissing fistula

Also urethral injury seems more likely to occur when there is bleeding from the frenum and an attempt is made to control it with a diathermy or heavy suture. A suture placed too deeply may strangulate a part of the urethral wall, thus leading to the formation of a fistula. Extensive bacterial or mycotic urethritis after circumcision may also results in a proximal fistula (Fig. 35.8b).

Bad hygiene, lack of follow up and supervision of the child after circumcision may lead to a disastrous fistula formation from hair coil, this hair coil fistula was reported in a healthy babies without relation to circumcision, but the healing circumcision wound is more liable to develop fistula after a hair coiling around or distal to the glans during the early post circumcision period, this fistula reported infrequently,

and known as a penile tourniquet syndrome [9] (Fig. 35.9a, b).

Sometimes this fistula supervenes glans gangrene due to impaired blood supply from the coiled hair, or fistula may be associated with a severely constricted coronal sulcus, in such cases a double fistulous openings may be seen at the under surface of the glans and the penile shaft (Fig. 35.9b).

Repair of such cases are extremely difficult, with high incidence of recurrence, so this fistula should be managed by an experienced hypospadiasologist. Delayed flap repair can be done electively after the child's penis has grown enough for good tissue handling.

In attempting to repair such a fistula, it should be borne in mind that in a circumcised penis, little free skin is available, particularly in the area of the frenum. The method chosen for repair should therefore be the safest. Urinary diversion and a repair without tension appear to be desirable [10].

The prevention of fistula complication lies in the operators visualizing exactly what is being done in the course of a circumcision, family education and detection of any congenital anomalies before committing MC, with early referring patients to centres with pediatric urology experience if complication happened.

**Keloid Formation:** (Fig. 35.10) A keloid is an abnormal development consisting of a raised, firm, thickened, red piece of scar tissue. Such abnormal scar at the site of circumcision creates a grotesque deformation of the organ, with obstruction of its function. Less extensive prominent scars can occur with severe fibrosis around the coronal sulcus. It seems that this complication is more common in blacked races, and prolonged wound healing, foreign body implant during circumcision and rough manipulation of the delicate penile skin are predisposing factors [11]. Keloid excision with or without skin grafting is indicated along a different postoperative measures to avoid recurrence of a keloid tissue.

**Skin Bridge** Another adverse result of circumcision is the formation of a skin bridge between the penile shaft and the glans. Smegma often accumulates under those skin bridges. Additionally these bridges may either tether the erect penis, with resultant pain or penile curvature (chordee) (Fig. 35.11).

The treatment of such bridges is simple surgical division. How such problems arise is not completely clear. Some investigators have suggested that injury to the glans at time of circumcision, with resultant fusion to the circumcision



**Fig. 35.10** Rare complication of circumcision with extensive keloid formation around the glans



**Fig. 35.11** Post circumcision skin bridge, results in penile curvature

wound is the genesis of this problem [12]. This complication could be avoided by completely freeing the inner preputial epithelium from the glans at the time of circumcision, also if any glanular abrasions, injury or ulcer, detected, during circumcision it should be dressed and managed properly till complete healing, to avoid the natural cohesion between bared area of the glans and penile skin.

### 35.3 Gangrene and Penile Loss

Necrosis and sloughing of the glans or even the entire penis has been reported following circumcision. Distal ischemia producing such tissue loss may result from infection, use of solutions containing epinephrine, vigorous attempts at hemostasis with suture or cautery, from prolonged use of a post circumcision tourniquet, or a tight bandage. Necrosis is particularly likely to result if cautery is applied directly to a circumcision clamp (e.g., the Gomco clamp), use of unipolar, or unearthed diathermy [13]. When the entire penis is lost following such a misadventure, a sequence of complications supervene the situation in the form of urethral stricture, retention of urine, proximal urinary tract obstruction and a dismal outcome.

Severe post circumcision mycotic infection, and Fournier's gangrene which is a necrotizing infection that involves the soft tissues of the male genitalia is reported after circumcision, specially at older age [14] but this could also happen at younger age, or even in a neonate, as we can see in figure 12, which show a newborn with almost complete necrosis of the penis and upper part of scrotum after circumcision, ischemia and tissue necrosis may precede or predispose this severe infection and tissue necrosis. Vasodilators medication and hyperbaric oxygen may had a limited role in such cases, but could be tried.

Cases with either glanular or penile ischemia should be identified early, and managed properly in a specialised centres, as an early combined use of intravenous Pentoxifylline (which reduce blood viscosity, platelet aggregation and thrombus formation, and also a powerful peripheral vasodilator) with hyperbaric oxygen reported to improve some cases [15], but it will be less effective in cases detected late with an already detectable gangrene with a line of demarcation. In this situation it may be extremely difficult to control penile ischemia and to stop its proximal progression, with a subsequent sloughing of the glans or even the whole penis (Figs. 35.12 and 35.13).

In children with complete penile loss (Ablatio penis) early management have to be directed to maintain an adequate urine flow with an acceptable meatus to avoid the need for diversion, and to avoid urinary back pressure and recurrent UTI (Fig. 35.14).

Latter on, those children will face the options of either penile reconstruction with a forearm pedicle flap or they may have to choice reassignment to female sex as described in Chap. 8.



**Fig. 35.12** A neonate with severe necrotising infection of the penis and scrotum after circumcision





**Fig. 35.13** Severe ischemia and dry gangrene of the penis after using monopolar diathermy during circumcision for a 3 years old child



**Fig. 35.14** Same child in Fig. 35.13, 3 months later with complete loss of the penis (ablatio penis), and severe meatal stricture which necessitate suprapubic diversion

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